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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,945	04/17/2006	Katsumi Shibayama	46884-5451	8454
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EXAMINER				
LAM, CATHY N				
ART UNIT		PAPER NUMBER		
2811				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/565,945

**Applicant(s)**

SHIBAYAMA, KATSUMI

**Examiner**

CATHY N. LAM

**Art Unit**

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 July 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-8 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 30 July 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/CIS)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. This Office Action is response no the Amendment filed on 07/03/2008.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. The claimed limitation of "said surface of said coating layer", as recited in claim 1, is unclear as to which element is the applicant refers.

5. The claimed limitation of "a substantial flat surface", as recited in claim 2, is unclear as to which element is a substantial flat surface.

6. The claimed limitation of "the portion", as recited in claim 2, is unclear as to which portion the applicant refers.

7. The claimed limitation of "the outer edge portion of said recessed portion", as recited in claim 2, is unclear as to which element is the outer edge portion of said recessed portion

8. The claimed limitation of "the bottom portion", as recited in claim 7, is unclear as to which bottom portion the applicant refers.

9. The claimed limitation of "the outer edge portion", as recited in claim 8, is unclear as to which element is the outer edge portion.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-8, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over the

Applicant's Admitted Prior Art (AAPA) in view of Ogiu et al. (Pat # 5,098,630).

Regarding claim 1, AAPA fig. 32 shows a back illuminated photodetector comprising: a first conductive type (n-type) semiconductor substrate 101; a second conductive type impurity semiconductor region 102 (P+ type) provided in a first superficial surface layer of the said semiconductor substrate 101; and a recessed portion (U shaped groove) for incidence of to-be-detected light formed in a second surface of the said semiconductor substrate and in an area opposite said impurity semiconductor region; and a window plate 113 provided on said surface to transmit said to-be-detected light to said coating layer.

AAPA does not disclose a coating layer made of resin for transmitting said to-be-detected light to said recessed portion and having a substantially flat surface, said coating layer being provided on the second surface.

In the same field of endeavor, Ogiu discloses a coating layer 21 fig.5 (col.3, line 50) made of resin (col.3 line 49) for transmitting said to-be-detected light to said

recessed portion and having a substantially flat surface, said coating layer being provided on the second surface fig.5.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a coating layer made of resin for transmitting said to-be-detected light to said recessed portion and having a substantially flat surface, in order to covering the image surface (abstract) and reduce the dimension of the device (col.1, line 33-34).

Regarding claim 2, AAPA discloses the back illuminated photodetector according to claim 1.

AAPA does not disclose wherein said coating layer consists of a first resin layer provided on the second surface and second resin layer provided on said first resin layer and having a substantially fiat surface on the opposite side of said first resin layer, and wherein said first resin layer is arranged in such a manner that the portion provided on said recessed portion in the second surface is sunk lower than the portion provided on the outer edge portion of said recessed portion.

In the same field of endeavor, Ogiu discloses wherein said coating layer consists of a first resin layer 21 provided on the second surface and second resin layer 22 fig.5 (col.3, line 50) provided on said first resin layer 21 and having a substantially fiat surface on the opposite side of said first resin layer 21, and wherein said first resin layer 21 is arranged in such a manner that the portion provided on said recessed

portion in the second surface is sunk lower than the portion provided on the outer edge portion of said recessed portion fig.5.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a coating layer consists of a first resin layer provided on the second surface and second resin layer provided on said first resin layer and having a substantially fiat surface on the opposite side of said first resin layer, and wherein said first resin layer is arranged in such a manner that the portion provided on said recessed portion in the second surface is sunk lower than the portion provided on the outer edge portion of said recessed portion, in order reduce the dimension of the device.

Regarding claim 3, AAPA discloses the back illuminated photodetector according to claim 1 or 2, further comprising a supporting film (not labeled but on the first surface) provided on the first surface of said semiconductor substrate to support said semiconductor substrate fig.32.

Regarding claim 4, AAPA discloses the back illuminated photodetector according to claim 3, further comprising a filling electrode 105 penetrating through the supporting film and connected electrically to the impurity semiconductor region 103 at one end thereof fig.32.

Regarding claim 5, AAPA discloses the back illuminated photodetector according to claim 1 wherein said window plate 113 has a square cross-sectional shape with at least one comer being chamfered in a plane perpendicular to the thickness direction thereof fig.32.

Regarding claim 6, AAPA disclose the back illuminated photodetector according to claim 1, wherein a highly-doped impurity semiconductor region 103 with impurities of said first conductive type added thereto at a high concentration (n+ type) is exposed fig.32.

AAPA does not disclose a highly-doped impurity semiconductor region across the entire side surface of said semiconductor substrate.

I would have been obvious to one of ordinary skill in the art at the time the invention was made to modify a highly-doped impurity semiconductor region teaching of AAPA to a highly-doped impurity semiconductor region across the entire side surface of said semiconductor substrate as claimed, in order to have design type of device.

Regarding claim 7, AAPA disclose the back illuminated photodetector according to claim 1, wherein a highly-doped impurity semiconductor layer with impurities of the first conductive type added thereto at a high concentration (n+ type) 103 is provided in the bottom portion of the recessed portion within the second superficial surface layer of the semiconductor substrate 101 fig.32.

Regarding claim 8, AAPA disclose the back illuminated photodetector according to claim 1, wherein a highly-doped impurity semiconductor layer with impurities of said first conductive type added thereto at a high concentration (n+ type) 103 is provided in a second superficial surface layer in the outer edge portion of said semiconductor substrate 101 fig.32.

***Response to Arguments***

12. Applicant's arguments, see Remarks, page 7, filed 7/3/2008 with respect to Ootera does not qualify as prior art because the international filing date of July 22,2004. have been fully considered and are persuasive. The rejection filed on 4/29/2008 has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ogiu et al. (US Pat # 5,098,630).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CATHY N. LAM whose telephone number is (571)270-5021. The examiner can normally be reached on M-F 7:30AM to 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Gurley can be reached on 571-272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CL  
10/22/2008

/Ori Nadav/

Primary Examiner, Art Unit 2811